Problem M: The Grail Trials (III)

The third and final trial before reaching the room where the Holy Grail can be found is *The Path of God*. Indy comes to the edge of a cliff, where the only way forward seems to be an impossible jump across a very long distance, to the other side of a deep canyon.

Figure 1: Only in the leap from the lion's head will he prove his worth

Time is ticking, and after some hesitation, Indy finally understands what is required of him: a leap of faith. He takes a deep breath, lifts one leg, and makes the first step, which to his great surprise is met with solid ground... He's standing on an invisible bridge.

Now, faith is a complicated thing to measure, but we'll try anyway. Obviously, Indy's first steps are very critical; at that point his faith is severely tested. But after the initial shock, he keeps walking and with each step his faith is increased considerably. We will say that there is a function $F(i)$ that describes the amount of faith that Indy feels when taking the ith step. For our purposes, F will be defined as follows:

$F(1) = a$

$F(2) = b$

$F(n) = xF(n-1) + yF(n-2)$ for $n > 2$

Where a, b, x and y are constants that reflect Indy's initial state of mind and spirit.

Let's consider an example. If $a = 0$, $b = 1$, $x = 2$ and $y = 3$, the "faith value" when taking the first few steps would be:

Step	Faith
1	0
2	1
3	2
4	7
5	20

Your task now is to evaluate the function F in different cases. As this number can grow very large very quickly, you must print only the last three digits of $F(n)$.

Input

Input starts with a positive integer **T**, that denotes the number of test cases ($T \leq 10000$).

Each case is composed of five numbers, in order: **a**, **b**, **x**, **y** and **n**.

$0 \leq a, b, x, y < 1000$; $1 \leq n \leq 10^{15}$

Output

For each test case, print the case number, and then the three last digits of $F(n)$. Make sure to print exactly three digits, padding the result with zeroes to the left if necessary.

Sample Input

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2
0 1 2 3 5
3 5 1 2 42
```

Output for Sample Input

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Case 1: 020
Case 2: 805
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